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JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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# AMATEUR RADIO

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## EDITORIAL



### DANGER—HIGH VOLTAGE

How safe is your station equipment?

Can you make adjustments to (or perhaps even operate) your transmitter without being incinerated?

There are pages in most handbooks which make reference to the potential lethality of the power supplies of even low power transmitters. How about turning up those pages for a "refresher"?

Is your transmitter installation so arranged to minimise the danger to accidental shock? Is there any possibility of the junior operator becoming entangled in the "haywire," "haywire" that may be "hot"?

Do you rely on a bleeder to discharge your filter condensers or do you discharge them with an insulated screwdriver anyway, because the bleeder may have broken down?

Are there any protruding grub screws on knobs controlling the shafts which are "hot"?

Can you isolate all equipment from the mains by a suitable accessible switch?

Does your station conform with fire underwriters' specifications? You have no claim against an insurance company in case of fire if it can be shown that the underwriters' rules were not met.

The argument that experimental work cannot be carried out with equipment which is nicely dressed up in crackle finish panels complete with a brace of safety devices is foolhardy.

Be sure that the design of all equipment you use is fundamentally safe.

E. D. T.

Have you studied the list of Amateur frequency allocations and types of emission on page 13 of the February issue of "Amateur Radio"? Impressive, aren't they? Frequencies throughout the spectrum, from 3.5 Mc. upwards, and (in the U.S.A. at least) no less than eight types of emission, covering every radio technique currently known.

You know, a decade back, the fellow who worked all bands, and both phone and CW, was not performing any great feat after all. Today—well, there is no escaping the fact that the trend must inevitably be to specialisation, specialisation both in frequency and technique.

But to be effective, this requires the speedy and widespread dissemination of specialised information. That is why, as a first step, the Federal Executive of the W.I.A. recently asked each Division to appoint a V.H.F. officer. That, also is where this Journal can help, but only if you do your bit.

A. H. C.

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# "UNFOLDING THE FOLDED DIPOLE"

By K. W. MAGEE (VK3KM), A.M.I.E.E., M.I.R.E. (Aust.)

One "rag" which has been much "chewed" of late months, especially among 10-meter addicts, is the impedance transforming property of the folded dipole, particularly with reference to its use in matching the low feedpoint impedance of a three or four-element close-spaced parasitic array as normally used for rotary beams. The writer had considerable discussion on this matter with various people before putting up his own beam and had just commenced to take a renewed interest in the matter, because of the opportunity for changes offered by the temporary dismantling of said beam, when the article by George Choules (VK3AHB) appeared in February "Amateur Radio."

The action of the simple folded dipole is fairly well understood by now and as is also the action of those folded dipoles of more than two elements of identical cross section. The accepted views are clearly and concisely given in the extract from Carter's original article quoted by VK3AHB, and in the relevant portions of his article. (Further references concerning such dipoles are: "Multi-Wire Dipole Antennas," J. D. Kraus (W8JK), Electronics Jan. 1939, and R.S.G.B. "Amateur Radio Handbook," second edition, p. 204.) The point around which most discussion now centres and to which VK3AHB applied himself, was the action of folded dipoles of two dissimilar elements. VK3AHB based his treatment of the dipole with elements of unequal diameters on the assumption that (quoting George), "the (total) centre current will divide in proportion to the conductivity or sectional area of each conductor." This statement at once met with much sales resistance in the mind of the writer, for the following reasons:—

(a) As VK3AHB himself points out later in his article, the current in the conductors travels mostly on the surface of the conductor since we are dealing with r.f. currents. He states, however, that this does not affect the validity of his treatment although the latter requires the conductivity to be proportional to "sectional area" (i.e. to diameter squared). Now, a moment's thought will show that the surface area of a cylinder is in linear proportion to the diameter and if the current travels on the surface, one would, at first sight, imagine that the conductivity (for r.f.) should similarly be proportional to the diameter, unless the penetration depth changes. Further consid-

eration, moreover, will show that increased diameter will not affect the depth of penetration of the material by the current, since the ratio of r.f. resistance to d.c. resistance increases linearly with diameter. We find, therefore, that the r.f. conductivity is not proportional to area (or diameter squared), but is definitely proportional to the first power of the diameter, so that doubling the diameter will increase the conductivity by a factor of 2 and not by 4.

(b) In any case, the conductivity (even at r.f.) of a simple aerial, has very little effect in determining the current flowing in it—again as VK3AHB himself points out, in a simple aerial, the current  $I = \sqrt{W/R}$  where  $W$  equals power supplied and  $R$  equals the total effective resistance in which the power is dissipated. Now  $R$  includes the r.f. ohmic resistance of the aerial, the equivalent loss resistances and the radiation resistance. Of these the radiation resistance, normally about 73 ohms, is so large in comparison with the others that, for all practical purposes, they may be neglected and the term "R" set down simply as the radiation resistance. It is then apparent that the changes in the distribution of current among the elements of a folded dipole must be related to changes in the effective radiation resistance of the elements and not to changes in the r.f. conductivity.

Now the radiation resistance of a simple dipole in free space is not much affected by changes in diameter of the elements and in a folded dipole, similarly, the radiation resistance of the aerial, as a whole, remains at about the 73 ohms that any one of the elements would have in the absence of the others. This gives us a glimpse of a method of visualising the operation of the folded dipole. Since the current (and thereby the power radiated), is divided between the elements, they may be regarded as a parallel arrangement of radiation resistances which total 73 ohms when treated in the usual manner for parallel resistances. When considering the input impedance, however, assuming that, as usual, only one element is connected directly to the feed line, we must remember that although only the current of one dipole will flow at the feed point, the power for the others must also be supplied there and consequently, the feed point resistance will be higher than the (effective) radiation resistance of the fed element. Let us take an example

here to clarify the picture. In a folded dipole of two similar elements, one of which is fed at the centre, the current is taken as equal, in each element, to half the current required to radiate a similar power from a simple dipole.

Thus, if the power radiated is 73 watts, the total current must be 73

— = 1 amp., and half an amp. flows 73

in each dipole which has, therefore, an effective radiation resistance of 146 ohms (since the same voltage has produced half the current that flows through 73 ohms). The two radiation resistances are equal in parallel, to 73 ohms. At the feed point, 73 watts are required at a current of  $\frac{1}{2}$  amp., so the feed point resistance

is  $\frac{73}{\frac{1}{2} \times \frac{1}{2}} = 292$  ohms, which is still

OK by VK3AHB. In this case and also in others where elements are all equal, the feed point resistance happens to be equal to the sum of the individual radiation resistances in series and we may be tempted to apply the same treatment in other cases.

But when the elements are unequal, complications set in, since it may be taken that the currents will be unequal and, if we take the case where one element is carrying most of the current, it will obviously have a lower effective radiation resistance, not much more than the 73 ohms of the whole. Now, although the parallel conception still holds for the radiation resistances, it is obvious that we can not simply add the radiation resistances to get the feed point resistance, since this would give a lower feed point resistance with very little current flowing, than in the case where the currents divided equally. Manifestly, this is not a supportable conclusion, and we must find a solution of the paradox. Let us remember the principle on which we find the feed point resistance. It demands that the total power must be supplied at the current flowing in the fed element. It is apparent then that the radiation resistances of the other elements are transformed at the feed point, to that resistance, which, when added to the radiation resistance of the fed element, will make a total resistance such that our power requirement is fulfilled.

We may then set down these relations for any folded dipole:—

Let  $W$  = total power radiated.

"  $I$  = total current in all elements.

"  $R$  = radiation resistance of dipole as a whole = 73 ohms.

"  $i_1, i_2, i_3$ , etc. = current in individual elements.

"  $r_1, r_2, r_3$ , etc. = effective radiation resistances of individual elements.

"  $Z_1, Z_2, Z_3$ , etc. = feed point resistance of element used as fed element.

$$W = I^2 R \quad (1)$$

$$i_1 + i_2 + i_3 + \dots = I \quad (2)$$

$$\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} + \dots = \frac{1}{R} = \frac{1}{73} \quad (3)$$

$$Z_1 = \frac{W}{(i_1)^2} \text{ or } Z_n = \frac{W}{(i_n)^2} \quad (4)$$

(where  $n$  equals the number of any element.)

$$i_1^2 r_1 + i_2^2 r_2 + i_3^2 r_3 + \dots = W \quad (5)$$

From (4) and (5)—

$$Z_1 = r_1 + \frac{i_2^2 r_2 + i_3^2 r_3 + \dots}{i_1^2}$$

$$= r_1 + \frac{W - i_1^2 r_1}{i_1^2} \quad (6)$$

If you have been patient enough to have reached this point, you will perhaps have a clearer idea of just how a folded dipole gives an impedance transformation and no doubt you will agree that determining the impedance ratio of any folded dipole is very simple when either the current in, or the effective radiation resistance of, each branch is known.

Unfortunately, we still have to find how to arrive at these values in any case of dissimilar elements. We begin to see why these cases are less responsive to simple treatment than those of similar elements, since, in the latter, we can simply assume that the currents and effective radiation resistances are equal and there is no necessity to arrive at their values by any other method than dividing or multiplying the total values by the number of elements. However, with dissimilar elements, we can not use this method and so we must find some other approach which will give us the desired values.

Having reached this point, the writer enlisted the aid of Dr. R. Guertler in a fundamental analysis of the problem. After much discussion, Dr. Guertler produced a most ingenious mathematical treatment which is given, in condensed form, as an Appendix, as it deserves a section all to itself. To be brief (1), this discloses that when dissimilar elements are used, the current distribution and the respective radiation

resistances are governed by two factors, namely, the ratios of the radius of one element to:—

- (a) the radius of the other, and
- (b) the spacing between them.

These relations are given to an adequate degree of approximation by the expression:—

$$x = \frac{\log \frac{s}{a_1}}{\log \frac{s}{a_2}}$$

where  $s$  = spacing between the elements.

$a_1, a_2$  = element radii.  
and  $x$  = current ratio.

From the previous articles, we have that the impedance ratio equals  $(x + 1)^2$  and we can now determine, at least to more than sufficient accuracy for practical work, the impedance ratio of a dipole of dissimilar elements. Practical considerations show that the limit of impedance ratio for dipoles of two dissimilar elements is approximately 20 and in most normal constructions the ratio is much less than this.

A case of very common interest, in view of the number of conflicting and erroneous statements made in several publications, is that wherein an impedance ratio of 9 : 1 is required, e.g. to match a dipole to a 600 ohm line or an 8 ohm beam to 72 ohm co-axial cable. Here the relations may be simplified to:—

$$\frac{s}{a_2} = \frac{s}{a_1} \quad (\text{see eq. 9 Appendix})$$

We see that for the usual construction of

$$\frac{a_2}{a_1} = 2$$

to hold good for this impedance ratio, the spacing between elements (centres) must equal the diameter of the larger element, a condition which has not so far been expressed elsewhere.

It is of interest to examine VK3AHB's own beam as an example in the use of our formulae. Taking the figures for the actual elements given in his article,

$$a_2 = .1875 \text{ inch}$$

$$a_1 = .125 \text{ inch}$$

$$x = \sqrt[3]{12} - 1$$

$$= 2 \sqrt[3]{3} - 1 = 2.464$$

From eq. 7 (Appendix).

$$\log \frac{a_2}{a_1} = 1.464 \log \frac{s}{a_2}$$

From this we obtain  $s = .25$  inch which is less than the sum of the radii.

This indicates that it is not possible to obtain an impedance ratio of 12 to 1 with the given diameter ratio. Taking the actual spacing used by VK3AHB at 1 1/2 inches we have:—

$$x = \frac{\log \frac{1.5}{.125}}{\log \frac{1.5}{.1875}} = \frac{\log 12}{\log 8} = 1.19 \text{ approx. (eq. 5 Appendix).}$$

So the impedance ratio equals—  
 $(x + 1)^2 = (2.19)^2 = 4.81.$

How then, can we reconcile this with the apparently small mismatch evidenced by VK3AHB's feedline and the results obtained with his beam? The answer, most probably, lies in that, in adjusting his beam with his folded dipole in place, VK3AHB arrived at a combination of element lengths which gave good forward gain but presented a higher radiation resistance than the normal figure taken for a 4-element beam, i.e. approximately 14 ohms instead of 6.

Study of the various articles on parasitic beams will indicate that to obtain such a value requires a very little alteration to the normal element lengths. This is a good example, and timely reminder, of the fact that theoretical treatment of beam antennas must be supplemented by much "pudding-proving" when the ideal free space conditions are replaced by mundane backyards. However, let us now see how we could get the 12 to 1 ratio required if the beam radiation resistance were 6 ohms as per book and we wanted to use 1/2-inch elements and 1 1/2-inch spacing. From eq. 7 Appendix:—

$$\left(\frac{s}{a_2}\right)^{x-1} = \frac{a_2}{a_1}$$

$$x = \sqrt[3]{12} - 1 = 2.464$$

$$\text{So } \frac{a_2}{a_1} = \left(\frac{3/2}{3/16}\right)^{1.464} = \text{approx. } 21$$

So our feed element should have a diameter of approximately .018 inch, which can be, in practice, a wire of about 28 s.w.g.

You are, of course, getting ready to ask, "but how are we to know if the radiation resistance of our beams is going to be close enough to the published figures to enable us to use the formulae with any hope of a correct match in practice?" The answer, I fear, is that you don't know it, but if the beam elements are proportioned and spaced correctly as per book, the effective height is really what it should be (this point alone deserves a good deal of study) and there are no major disturbing elements in the

vicinity, and the folded dipole is constructed correctly for the book figure of radiation resistance and the known co-axial impedance, very little pruning will be required to give a very satisfactory antenna, from all points of view and the compass. In any case, it is felt that the mental effort to clarify matters has been well worthwhile, since a reasonable basis for calculation has been provided, based on solid grounds, and after all, I think that is what George wanted to spur someone into doing.

If you have lost your log tables and the slipstick has run a big end, the charts given in the Appendix should save a few splinters under the finger

nails. They will be found adequate for most amateur matching problems.

## EDITORIAL FOOTNOTE

Comments by George Choules (VK3AHB) and discussions arising will be published in the next issue of "Amateur Radio." The Appendix by Dr. Guertler should prove of great interest to those readers who like to reduce cut and try methods to a minimum, while the chart supplied should make life much easier for the constructor anxious to obtain the desired results without overburdening the grey matter.

## APPENDIX

# CURRENT DISTRIBUTION AND IMPEDANCE RATIOS IN FOLDED DIPOLES

By R. GUERTLER, Dr. Tech. Sc. (Brno).

Compare the folded dipole, Figure 1, with the simple dipole Figure 2, of the same physical dimensions. It is obvious that the current and voltage distribution in both aeriels is practically identical so long as we deal with the purely oscillating energy (and this is permissible when  $Q$  is high, say, greater than 3, as is the case with all usual diameters). The dipole of Figure 1 differs from that of Figure 2 only in the impedance offered to the feed line. In Figure 2, we have in each plane  $p$ , normal to the aerial equal potentials on both conductors. This statement is obviously true for the driving points A and B and for the ends E and F (neglecting the complications due to the end effects, etc.). It follows, logically, that it holds for each plane  $p$ , since the potential distribution of the aerial as a whole is common to both portions.

It is convenient to consider the current distribution by determining the ratio of the charges on the two conductors in any such plane  $p$ , at the moment when the current is zero and the charges have momentarily no motion—i.e. the instant when the voltage is at maximum value. By so doing, we need not consider the effects of the magnetic field. (At the other limiting condition, viz., maximum current and zero voltage, the same total amount of energy is now existing in the form of magnetic field and an analysis produces practically the same result, so long as  $Q$  remains reasonably large. At other times, we have a composite function determining the potentials, but the assumption of a sinusoidal variation implies that the relations will hold.)

Equal potential is obtained only when the larger diameter aerial (see Figure 3), takes more charge—i.e. carries a larger current. (Current

equals the rate of change of the charge.) This can be seen from the following reasoning. The construction of the folded dipole enforces equal potentials on both conductors at the ends since they are connected together. The construction of Figure 2 ensures further equal potentials at A and B and, in consequence, in each plane  $p$ . The equal potential on the surface of both conductors in each plane  $p$  is the primary condition from which arises, as a consequence, the corresponding distribution of charge.

For the computation of the ratio of the charges, we consider Figure 4. The total charge  $q_1$  of a thin section of the left aerial, we replace by an equal charge in the point  $Q_1$ , so chosen as to give the same potential in an arbitrary point P in the plane

$p$ . The total charge  $q_2$  of a thin section of the other conductor, we concentrate similarly in a point  $Q_2$ . This substitution is an approximation only, but the error is small for  $d_1$  less than  $0.6s$  where  $d_1$  is the larger diameter. In these cases, the points  $Q_1$  and  $Q_2$  are at negligible distances from the centre points of the respective elements. The potential component in the point P due to  $q_1$  at  $Q_1$  is known to be  $-2q_1 \ln r_1/r_0$  and the potential component due to  $q_2$  at  $Q_2$  is, similarly,  $-2q_2 \ln r_2/r_0$ ,  $r_0$  being a constant. The sum of both components is the total potential U at the point P.

$$U = -2q_1 \ln r_1/r_0 - 2q_2 \ln r_2/r_0 \quad \text{eq. .... (1)}$$

The ratio  $x$  of the two charges and thus, of the currents, is:

$$x = \frac{q_1}{q_2} = \frac{r_2}{r_1} \quad \text{.... (2)}$$

If we put for convenience

$$\begin{aligned} -U &= -u, \quad r_0 = 1, \quad \text{we get,} \\ 2q_1 &= e^{-u} \quad \text{or} \quad \ln r_1 x = -u \end{aligned}$$

We stated that all points of the surface of both conductors are of equal potential. As representative points, we choose  $P_1$  and  $P_2$  in Figure 4. If

$$\frac{d_1}{2} = a_1, \quad \frac{d_2}{2} = a_2,$$

we get from (3) approximately  $e^{-u_1} = a_1 x^2$  for the point  $P_1$ , and  $e^{-u_2} = s a_2^2$  for the point  $P_2$ . Our conditions are satisfied if  $u_1 = u_2$  or  $a_1 x^2 = s a_2^2$  .... (4)

where  $x$  = current ratio  
 $a_1$  = radius of one element  
 $a_2$  = radius of other element  
 $s$  = separation (between centres).



Fig. 5.



Fig. 7.



Fig. 1.

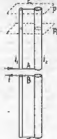


Fig. 2.



Fig. 6.



Fig. 8.



Fig. 3.



Fig. 4.

From this equation, we get the current ratio  $x$  if the physical values are given:

$$x = \frac{\log s/a_1}{\log s/a_2} \quad (5)$$

It is immaterial whether we use natural or decade logarithms. Chart 1 may be used to apply eq. 5 without calculation. The feed point impedance for the folded dipole is derived from the power relation between Figures 1 and 2.

$i_1/R_1 = (i_1 + i_2)/R_0$ , where approximately  $R_0 = 73$  ohms,

$$R_1 = \left(1 + \frac{i_2}{i_1}\right) R_0 = (x + 1) R_0 \quad (6)$$

A more usual task than the above-mentioned one arises when a certain input resistance,  $R_1$ , is required and the total radiation resistance,  $R_0$ , is known. In consequence, an impedance ratio  $R_1/R_0$  is required. We have a fairly wide choice of a ratio of two dimensions, e.g.  $s/a_1$ . From eq. (5) or chart 1 we obtain the other ratio, i.e.  $s/a_2$ . In other words, we have the choice of two values and the third has to satisfy eq. (4) or (5). A simple transformation of eq. (4) provides us with the more convenient chart 2 which represents:—

$$\begin{aligned} (s/a_2)^{x-1} &= a_2/a_1 \text{ or} \\ \log a_2/a_1 &= (x-1) \log s/a_2 \\ &= (\sqrt{R_1/R_0} - 2) \log s/a_2 \quad (7) \end{aligned}$$

$$\text{because the current ratio } x = \sqrt{R_1/R_0} - 1, \quad (8)$$

as eq. (6) shows. For a current ratio  $i_1/i_2 = 2$  or  $R_1 = 9R_0 = 660$  eq. (7) is simplified to  $a_2/a_1 = s/a_2$ .

For example:  $s/a_1 = 4$  or  $s/d_1 = 2$  requires (for  $x = 2$ ),  $a_2/a_1 = 4$ , i.e., the larger diameter is four times the smaller.

The treatment of other aeriels of this type is similar, and incidentally, explains why the dipole of type Figure 5 has been found in practice to have a driving point impedance somewhat greater than  $9R_0$ . If we consider that the potentials on the surface of each conductor in the same plane  $p$  must be equal, we realise that the middle conductor (Figure 6) takes a smaller charge  $q$  than either of the outer conductors. Consequently, the current  $i_1$  is less than  $i_2$ . Of course, it is possible to get equal currents if we increase properly the diameter of the inner conductor or arrange the three elements in a triangular disposition so that they are at equal distances from each other.

But this effect may be turned to practical use since it provides a means of obtaining impedance ratios which are higher than can be obtained with a convenient diameter ratio in the construction of Figure 1, but which are

not equal to the square of some integer and therefore are not amenable to solution by the use of equal elements suitably arranged. In these cases, the construction of Figure 7 may be used, and, by a similar transformation, we can show that the relations pertaining are (see Figure 8):—

Impedance ratio (centre element fed):—

$$\frac{R_1}{R_0} = \left(\frac{2i_2 + i_1}{i_1}\right)^2 = (2y + 1)^2 = (x + 1)^2 \quad (10)$$

$$\left(\frac{s}{2a_2}\right)^y = \frac{s}{a_1} \quad (11)$$

$$\begin{aligned} \log \frac{s}{a_1} &= y \log \frac{s}{2a_2} \\ y &= \frac{\log \frac{s}{a_1}}{\log \frac{s}{2a_2}} = \frac{\log \frac{s}{a_1}}{\log \frac{s}{a_2} - \log 2} \quad (12) \end{aligned}$$

$$\begin{aligned} \log \frac{2a_1}{a_2} &= \log \frac{a_1}{a_2} + \log 2 \\ y - 1 &= \frac{\log \frac{s}{a_1}}{\log \frac{s}{2a_2}} = \frac{\log \frac{s}{a_1}}{\log \frac{s}{a_2} - \log 2} \quad (13) \end{aligned}$$

Taking examples, we find that for equal currents in three elements in line, Figures 7 and 8, the centre element must have twice the diameter of that of the others, and that for three equal elements in line, the current ratio is dependent on spacing. Also, the equivalent of a pentagonal arrangement of 5 equal elements i.e. a 25 to 1 impedance ratio, is obtained when

$$\frac{2a_2}{a_1} = \frac{s}{2a_2} \quad (14)$$

or, in other words, when the ratio of spacing to the diameter of the outer elements equals the ratio of outer element diameter to centre element radius.

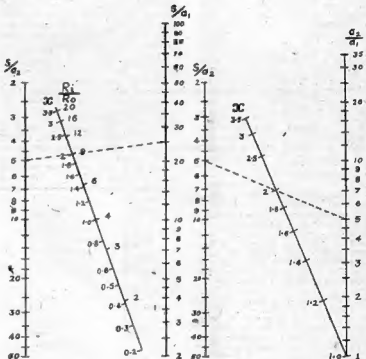


Chart.1.

Chart.2.

A straight edge laid across the scales will intersect corresponding values of spacing-radius ratio,  $s/a_1$ ,

or  $s/a_2$ , current ratio  $x$ , impedance resistance transformation ratio  $R_1/R_0$  and radius ratio  $a_2/a_1$  as indicated.



## FEDERAL NOTES.

# 1947 CONVENTION

We are pleased to give you this month a brief review of the Federal Convention held in Melbourne from 4th April to 7th April, 1947, including the opening addresses and the Federal President's Report, and the Financial Statement. Next month we will be able to present a précis of the motions arising from the Agenda.

The first session of the Convention was declared open by the Federal President, Mr. Vaughan Marshall, who called on the Federal Vice-President to welcome the visiting delegates, who were Mr. J. E. Corbin (2YC), Mr. W. Gronow (3WG), Mr. H. E. Sprenger (4ES), Mr. E. A. Barbier (5MD), Mr. G. A. Moss (6GM), Mr. J. Brown (7BJ).

Mr. R. J. Marriott, Federal Vice-President, said that on behalf of the Federal Executive he took great pleasure in welcoming the delegates, and said how pleased he was to see a delegate in attendance from each State. Mr. Marriott said that the Federal Executive had done quite a deal of work since the last Convention and he hoped that the delegates would consider that it had been done

to the satisfaction of the Institute.

The Victorian delegate seconded Mr. Marriott's remarks. Mr. Gronow also welcomed the delegates on behalf of the Victorian Division and said that he was hopeful that the delegates would have a profitable and happy time, and it was hoped that it would be possible to intersperse some of the serious business with social items and so break the monotony of the task. He felt certain that the Convention, from his Division's point of view, would be one of the most important yet held, and it was hoped that the results achieved would mark milestones in the history of the Institute. Mr. Gronow said further that he felt that his second year of post-war radio was one of great importance. He thanked the Federal Executive for their efforts and for the multitudinous tasks they had undertaken, and said that the results achieved had been great.

Mr. E. A. Barbier, in responding on behalf of the delegates, said that he, having been present at the previous Convention, had a fair idea of the amount of work done by the Federal

Executive, and said that his Division appreciated it. He said that he was sure that this Convention would be equally important with the last one, and it was the earnest desire of his Division to co-operate with the other Divisions and to further the cause of Amateur Radio.

At this stage nominations were called for the office of Chairman of the Convention, and the Federal President was elected unopposed. Mr. Marshall, in the capacity of Federal President then presented the Annual Report of the Federal Executive:—

## ANNUAL REPORT

The past twelve months has been a period of consolidation for the Wireless Institute, and considerable progress has been made, both by Divisions in the organisation of their domestic activities, and Federally in the overall control of reconstruction involved that there should have been difference of opinion concerning methods and procedure, and a feeling that progress was not being sustained at a high enough rate. However, after surveying the year's activity both in the Federal as well as the Divisional field, it is with no sense of complacency that your Executive feels that the year has been a satisfactory and progressive one for the W.I.A.

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In the Federal sphere, the progress made has resulted in large measure from the very clear mandate and statement of policy laid down by the Federal Council at the 1946 Convention, and the clarity of direction accorded the Executive, can be commended to this Conference. It is desired to report and comment on the major matter handled by your Executive during the past year, as follows:-

#### P.M.G. DEPARTMENT

Your Executive has maintained a very cordial relationship continuously with Officers of the P.M.G. Department throughout the year. There have been a considerable number of matters on which we were instructed to negotiate with the Department, and there has been a free expression of views on both sides. Although the Department has not subscribed to the W.I.A. attitude on all matters, excepting those which are still under review, on no subject of major concern except the return of 7200-7300 Kcs. has agreement not been reached. At all times your Executive has stressed the importance of reducing the number of restrictions to the minimum.

Some difficulty has been experienced during the year owing to the fact that varying interpretations of Regulations have been made by local P.M.G. Administrations in the various

States. In practically all cases the difficulties were speedily resolved. Your Executive believes that such problems will be overcome in the forthcoming year.

#### FEDERAL EXECUTIVE ADMINISTRATION

The volume of work to be handled by the Executive has now reached proportions beyond the capacity of a small body of members acting in an honorary capacity. During the past year the Federal Secretary has handled 443 separate communications in addition to the Minutes of 27 meetings, and all the many and various matters that fall to the lot of a Secretary of as active an organisation as the W.I.A. Your Executive has handled 117 items of importance to the Australian Amateur during the year, and has completed action on all relevant matters referred to it by the Federal Council. Despite the best endeavours of the members of the Executive, Divisions have not been as closely in touch with current Federal activities as either the Divisions or the Executive consider desirable. This matter as well as consideration of means whereby a paid officer may be added to the Federal staff are subjects your Executive commends to this meeting of the Federal Council as of special importance.

#### TECHNICAL DEVELOPMENT

While the Executive has been forced to concentrate in the main on W.I.A. administrative matters, during the past year, as the W.I.A. is still engaged on consolidating its organisation to meet post-war conditions, considerable thought has been given to the importance of setting up a program of technical development and providing the necessary co-ordinating machinery for inter-Divisional activities. There are possibly more untapped fields of experimental radio activity available today than ever before, and your Executive believes it is of the greatest importance that a virile program of research and experimentation be drawn up, and technical assistance provided to the many experimentally minded amateurs. A start has been made during the past year, but there is a great deal of work still to be done.

#### DEFENCE RADIO RESERVE

Negotiations with the R.A.A.F. have been carried on, with a view to reconstituting the R.A.A.F. Radio Reserve. The W.I.A. has been requested to prepare a broad plan as a basis of discussion and preliminary work has been carried out thereon.

#### I.A.R.U.

Your Executive has maintained close contact with the I.A.R.U. during the past year. The most important activity has been related to the forthcoming International Telecommunica-

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AUST. RADIO WORLD:	10/6 "	RADIO AND HOBBIES:	6/6 "
AMATEUR RADIO:	6/- "	SHORTWAVE MAGAZINE (English):	25/6 "

FOREMOST IN AUSTRALIA FOR TECHNICAL BOOKS.

tions Convention and the fullest possible information on the Australian situation has been forwarded to the Amateur Delegation appointed to represent the I.A.R.U.

#### CONTESTS

As directed by the Federal Council, an International Contest was organised but owing to the limited time available it was not as well patronised as usual. Arrangements have been made with N.Z.A.R.T. for reviving the regular VK-ZL contest in 1947, and action has been taken with the I.A.R.U. to reserve the month of October as in pre-war years. The Contest Manager's report on the year's activities is tabled herewith.

#### "AMATEUR RADIO"

Negotiations have been carried on with the Victorian Division as directed by the Federal Council, to determine a satisfactory formula for taking over "Amateur Radio" by the Federal Council. The basis agreed upon is submitted to this Convention for ratification.

The Magazine has been carried on by the Victorian Division during the year on the understanding that the Editorial Policy was under the control of the Federal Executive. The amount of work involved in publishing the Magazine is a heavy burden for personnel working in an honorary capacity, and this aspect requires very careful consideration when this Convention is examining the possibility of providing a paid officer to handle Federal Activities under the direction of the Federal Executive.

#### FINANCE

The Treasurer's statement of Receipts and Expenditure is attached herewith. The present level of capitation is inadequate to handle the scope of Federal activities on the scale required, and an examination of this subject is a matter of some consequence to this Convention and the expanding level of Federal activities.

#### CONCLUSION

At the present time the W.I.A. is in the strongest position in its long history. With the overhaul of Federal machinery at this Convention, with the modification of certain P.M.G. Regulations governing Amateur Radio in Australia, and with the limitless field of experimentation open to members, the W.I.A. can look forward with confidence to turning the brightest pages in its history. With pride in the past, and keen anticipation for the future, we can set our feet on the road which will turn the potential opportunities of today into the accomplishments of tomorrow.

#### STATEMENT OF RECEIPTS AND EXPENDITURE

At the conclusion of the presentation of the Annual Report, the Federal Secretary, on behalf of the Federal Treasurer, who was unable to be present, read the Statement of

#### Receipts and Expenditure

Receipts	
Balance at 1st April, 1946	£19 1 8
Per Capita Contributions from Divisions:—	
N.S.W.	£28 2 8
Victoria	12 0 0
Sth. Aus.	4 12 0
West A.	3 10 0
Tasmania	2 17 0

51 1 6"

£70 3 2

Payments	
Convention Minutes	£10 10 0
Convention Expenses	2 14 9
Postage	5 12 7
Petty Cash	6 4 9
Printing and Stationery	8 8 3
Telegraphic Address	2 2 0
QSL Postage	1 4 2
Cheque Book and Exchange	6 0

£37 2 6

Balance at 31st March, 1947

33 0 8

£70 3 2

"I have examined the above statement of the Receipts and Expenditure of the Federal Executive of the Wireless Institute of Australia for the year ended 31st March, 1947, and having obtained all the information and explanations required I am of the opinion that the transactions for the year are properly recorded therein. No per capita contribution has been received from the Queensland Division during the year and receipts have not been produced for the payment of £10/10/- to A. Brown for Convention Minutes or £1/17/- to Geo Raitt & Co. for stencils."—L. T. Powers, Chartered Accountant (Aus.) Hon. Auditor, 3/4/47.

The Annual Report and the Financial Statement were duly received and adopted by the Convention, which then began consideration on the Agenda. Consideration of the Agenda and the various items of general business occupied the Convention very fully until after mid-day on Monday, 7th April, when the Convention was formally declared closed by the Chairman.

The West Australian delegate (Mr. G. Moss) moved a vote of thanks to the Federal Executive for the work done during the year, and to the Chairman for his excellent handling of the business of the Convention. The New South Wales delegate (Mr. J. B. Corbin), in seconding the motion, said that for the first time in the history of the Institute the W.I.A. had functioned truly as a Federal body and every possible action had been taken by the Federal Executive to see that the Federal Council functioned efficiently. Mr. Corbin said that the Federal Executive had carried out their duties in a way un-

equalled in the past, and that all members should take time to consider what they owed to these people.

The remaining delegates expressed similar sentiments in support of Messrs. Moss and Corbin, and at the conclusion of their remarks the Federal President thanked the delegates for the interest they had shown in their task, and expressed his personal appreciation of the co-operation he had received during the past year from his colleagues of the Federal Executive.

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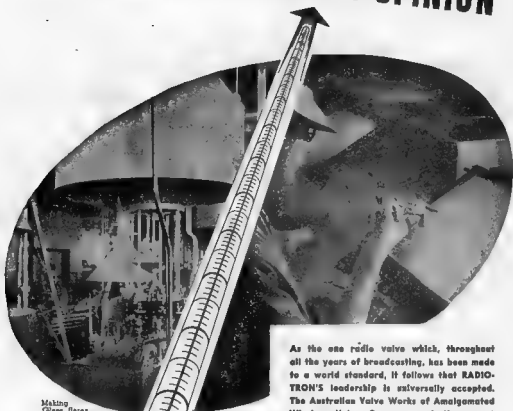
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# SUCH NICE PEOPLE

By "GREMLIN"

Honours this month go to 4HR for a nice long-haul job on 50 Mc. What is 2NO going to do about this? To battle Don, VK2 depends on you!

My booby prize was going to 3RW. How do you do it OM? I never could get a note that bad for the choicest bit of DX, but 3UH has gone several better. I can't believe it Ken—or describe it. However the time was 1000 E.S.T. on 5th April. Maybe it was a pirate, would like to know because your note has always been pretty good.

5SL, you and I aren't playing speaks. After all those things I said last month, Ross turns around and produces some hefty background music. "Singing Polly-Wolly-Doodle" of all things!

3ABG is also a music fan. Quite a long item on the Harp—refugee type—or something, much to the disgust of 3UL. I'm not joining the argument between you chaps on the legitimacy of putting over various musical instruments for test purposes. However, I do agree with UUG that it is not any help on our over-crowded bands, and that should be sufficient inducement to refrain. That goes for Des too!

A 60 watt globe coupled to the final tank makes a good dummy aerial that shouldn't be outside the means of any Ham. Admittedly some blokes would still send three or four in series but it is still pretty cheap and saves a lot of needless QRM.

3JD might consider the dummy aerial question. A session of whistling, mixed with background noise of numerous children, was hardly entertaining. The only reason I listened for five minutes was to hear your call. Apparently you were trying to convince sundry people you don't overmodulate. My views haven't changed. There is one thing OM, the hum does go down when you speak so I guess that's something.

2NY is putting out some decent key clicks but I think the matter is in hand. A key fend with a fone yearning, Roy!

3GU, another dyed in the wool c.w. man, has been bitten by the fone bug. There is one thing, when these c.w. old timers go for fone, they usually produce a fair quality sig. And that is probably because they have the r.f. side cleaned up before they start modulating the carrier.

3ADS might take a tip here. Your fone is about as good as your cw, Ron.

2CL also produces a nifty click, but haven't heard of anything being done about it.

Congrats to the various Divisions on their efforts for the "Food for Britain" appeal. Believe the latest in line is the VK3 gang. An auction of bits and pieces, ably conducted by Ray Ohrborn (3OC), and a whip around at the last meeting produced approximately £20 for the cause. By the way Ray, about time you made a comeback on the air. What's wrong, lost your cat's whisker?

Congrats Dave, 2EO, on your DX Contest win. What do the beam believers say about the Zepp now?

Glad I don't live too close to 4WF. Bad enough a few hundred miles away when you turn the wick up, and that is usually when the DX is at its best. I guess the temptation is too great. 4HG is another with a mighty splash.

Well, boys seem to leave the high end of twenty to the fone gang during DX hours. Not so the reverse. A quick run over the band the other night produced 2CW, 2SV, 2JN, 2TE, 3ADR, 3EV, 4WF, 5RC, 6PW and 6WG all on the low end with fons. DX was good at the time. Woodpecker could make a suggestion, but I guess that would be considered vindictive. Perhaps the day will come when we will find it necessary to divide the band, or maybe wisdom and consideration will prevail.

By the time this his print the shouting and tumult of the Federal Convention will have died and many wiser and happier delegates will have returned to the wolves. We think this 17th Convention will be one out of the box. Time will tell.

Think over this one heard recently. "Running 25 watts to p.p. 807s, modulated by p.p. 807s in ABs." How long does a torch battery last as a d.c. supply for the modulators?

Editor's Note.—The following are extracts from letters received during the month. Apparently "Gremlin" has a few supporters.

"Like you, I welcome the appearance of 'Gremlin' (bet he was a blue orchid?), although I must admit that of the half dozen brethren QSOed today, one did not appreciate the aforesaid 'Gremlin.' Perhaps someone's conscience is not too clear—or is it just lacking in a sense of humor?"

"I am very pleased to see 'Gremlin' on the job. It has been 'in my hair' for a long time the operating 'behaviour' of many of the Hams on the bands these days. May I suggest he start two sections in his article. (1) The bath section for Hams whose signals splash over various sections of the band, phone and c.w. (2) The 'abrasive' section for poor c.w. notes and bad distorted phone. Just a list of calls I think should suffice."

# FEDERAL QSL BUREAU

RAY JONES, VK3RJ, MANAGER

The R.E.F. have requested that all QSL matter be sent to the QSL Manager at the following address in lieu of the address of the Society—Service QSL R.E.F., 48 Rue St. Laurent, Laguy, (S. & M.), France.

VK3GE, ex-VK4EY, has returned to Victoria and is located at Balcombe. Glad to hear of your return George. George is also an ex-Tasmanian.

The address of the QSL Bureau for Colombia is:—Colombia QSL Bureau, P.O. Box 584, Bogota, Colombia.

The correct address for QSL matter for Egypt is:—Hal Frost, SU1HF, Box 360, Cairo, Egypt. Hal, the QSL Manager, is ex-W6IAQ.

The address of PK6VR for QSL purposes is:—PK6VR, L. D. Rickaby, Australian Radio Operative, Biak Isld., Dutch New Guinea, care 19th Squadron Archerfield, Brisbane. Bit of a mouthful but is in order. The station is operated by VK4VR and will cease to exist on 26th May, 1947.

The French broadcasting authority has requested the R.E.F. to solicit reports on the reception of the short wave broadcasts of the authority. The station will use the call sign TPA on all broadcasts which will consist of simultaneous transmissions in morse and telephony on a number of frequencies between 7240 and 17850 Kc. The stations will commence operation on May 7 and continue until November 7, 1947. The transmissions will be continuous excepting between 0445 to 0530 G.M.T. Listeners and others interested can obtain full transmitting schedules and frequencies from the Bureau and reports on reception should be addressed to the R.E.F., 1 Rue des Tanneries, Paris 13, France.

Bob Rowley, HP4Q, writes to say that he is under cover, and QSLs for him should NOT be sent via HP1A but should be sent either direct or via A.R.R.L. He mentions he worked many VK stations pre-war, but did not think his present small rig would be able to get through to VK, but it does.

Am indebted to BERS 195 for a further bunch of rare addresses. They include BA4ZE, F2GB, VU7JU, VP4TB, VP4TX, L2J2C, UC2AD, OE9AA, J9RCP, K6ETF/K6, V94AA, SUIUS, ZM6AC, PK6EE, KG6AD. Anyone wanting any of these may have same on application.

The QSL address for Fiji has been amended to VR2RH, D. A. Leslie, P. and T. Department, Suva, Fiji. Cards should NOT be sent to Box 237 any longer. Fourteen amateurs are licensed to date in Fiji, call signs ranging from VR2AA to VR2UH.

## MONTH'S DX

### WESTERN AUSTRALIA

**28 Mc. Phone.**—Band is still patchy but showing considerable improvement as weeks go by, particularly week-end of 22nd and 23rd March.

**Europe.**—Some excellent QSOs have resulted from 1500 to 2100 when band is open. LX1SI Luxembourg (getting fairly regular, these days), F8TU and F8TY France, G6WT, G5OU, G8TH, G2IG, G6GO, G4PC, G4CY, G3QK being the best by far with S8 and over, not forgetting the mysterious OIX7 Helsinki, Finland, who was QSO'd by 6KW and 6DF recently. The whole of VK and ZS have been chasing that bird.

**Africa.**—These boys from the dark continent may be heard and worked often now with some f.b. signals coming through. SU1HF and SU1WS Egypt, VQ4ERR Kenya, VQ3TOM Tanganyika, ZL1JZ Southern Rhodesia, with ZS5DA, ZS6EG, ZS6JB, ZS4H, ZS6EB, ZS1W, ZS1CN, ZS6BV, ZS6EQ providing good QSOs from the south.

**Asia.**—These J, VS, VU, and XZ are easier to QSO than local VKs these days. Two nice contacts were CR9AG Macao (opposite Hong Kong) and HZ1AB Hedjaz.

**Oceania.**—Towards end of month the KH6, KA and ZL have been pouring in. KH6BI and KH6FC Hawaii, FK8VB New Caledonia, and J8LG Kwajalein providing the best QSOs.

**North America.**—We still pouring through in droves, although conditions haven't been up to scratch except between 1100 and 1300 daily.

**Central America.**—Few choice contacts in CO2JV Cuba, KZ5NA Canal Zone, and YN1LB Nicaragua made earlier in month.

**South America.**—A surprise was in store for VK6 over Easter from this elusive Continent. Good Friday showed promise when YV1AN showed up. Saturday the band opened up with a wallup, HK3AO, HK3QS, HK3DW, YV1AN all being worked with S8-9 signals both ways. HC1FE was also worked on Easter Monday. W.A.C. in VK6 now has become quite regular.

**14 Mc. Phone.**—This band has provided the DX hound with plenty of entertainment this month, and this mainly is the reason why no notes are included in this issue.

**Europe.**—Has been wide open from midnight to 0300. PA0JQ and PA0FB Holland, OZ8SS Denmark, ON4US Belgium, F8GM and F8KI France, D4AKH and D4ATH U.S. Zone Germany, D2CI and D2CD British Zone Germany, I1SM Italy, HB9ET Switzerland, and G8WS, G2WW, G3AAK,

G6AG, G2PL, G3QK being the best of many English QSOs. From 1600 to 1800 occasionally has favoured "long way around" operation. Two good contacts were CT2WX Azores and W2MMO Portable D4 Marine, 800 miles S.W. to Azores.

**Africa.**—This Continent again coming through from 2300 onward, ZD6DT Nyassaland, ZL1JZ Southern Rhodesia, and many ZSs.

**Asia.**—Very consistent these days from 1700 onward and getting to the stage when VU, C, J, VS, etc., are not considered as DX!

**Oceania.**—KH6, KG6 and ZL still being worked—KH6HO being the best QSO.

**North America.**—Countless Ws appearing, from 1500 to after midnight, daily from the N.E. VEs from Canada included 3AJU, 3HC, 3QL, 3VU, 4IF, 4RP, all being excellent.

**South America.**—No contacts made this month although some of these elusive birds were heard. HC3JV Ecuador put in an S8 signal.

A few notes on country fans to VK6KW, c/o P.O. Box N1002, supplying a little information as to their activities would be appreciated.

## IN REVIEW

The new "Eddystone" Amateur Bands Communications Receiver Model 640 has been designed in collaboration with several expert amateurs and initial tests convince our Principals that in the 640 is a set that will prove a real "winner" with the Hams. The receiver has been designed primarily for Amateur Communication purposes, and it is arranged to operate from a.c. mains or from a 6 volt battery, by the use of a separate vibrator unit.

It is a nine valve superhet., the valves having the following functions: EF39 r.f., 6K8GT freq. changer, EF39 1st i.f., EF39 2nd i.f., 6Q7GT det., a.v.c. and audio amp., 6V8GT output amplifier, 6X4GT rectifier, EB34 noise limiter, EF39 osc.

The aerial circuit is arranged to match into 400 ohm feeder line, but good results are obtained with aerials, the impedance of which varies widely. The tuning is in three overlapping bands, which are selected by a low-loss, low-capacity switch. The ranges are: (1) 31 to 12.5 Mc., (2) 12.5 to 5 Mc., (3) 5 to 1.7 Mc. An electrical band-spread arrangement is used for this purpose. Fly-wheel control is utilised on the band-spread condenser drive, while the scale is clearly marked with all amateur bands, and is so arranged to enable accurate re-setting to a spot frequency.

A frequency of 1600 Kc. is utilised so that a really good image ratio is obtained, even at the highest frequency. The transformers are rigid-

ly constructed and permeability-tuned and have excellent frequency stability. The b.f.o. is constructed in a separate unit so that efficient screening is obtained. It is permeability-tuned and has a high degree of stability. Pitch is controlled by a variable condenser which is adjusted from the front panel. The xtal filter unit is the outcome of considerable development work. The xtal itself is vacuum mounted, ensuring a high degree of stability and outstandingly high Q. It is free from spurious responses, an adjacent channel attenuation in the order of 45 db being obtained. Phasing control and "in/out" switch, are brought out to the front panel. The a.v.c. system has been carefully designed, and may be switched in or out by a panel control. Sensitivity is better than 2 microvolts input, for 50 milliwatts output, at all frequencies. With xtal. out, selectivity is 25 db down at 10 Kc. off resonance.

A particularly efficient series limiter arrangement is used, and is controlled by a switch operated from the front panel. The image ratio at 30 Mc. is 45 db down, at 20 Mc. 55 db down, 10 Mc. 60 db down, 5 Mc. 60 db down, 2.5 Mc. 90 db down, and at 1.8 Mc. is 100 db down. Audio frequency output of the receiver exceeds 3.5 watts into a 2.5 ohm output which is provided at rear of receiver for loud speaker use, and a higher resistance telephone output is available at a jack on the front panel. The speaker can be cut out when phones are plugged in. A socket is provided at the rear of receiver so that an external S meter unit can be connected when required. The scale of the meter is illuminated from the rear, by two 6 volt 1.8 watt, bayonet fitting lamps.

The weight is 38 lbs (unpacked) and dimensions are: overall width, 16 1/2 inches; depth 19 inches, height 8 1/2 inches. Power consumption, 60 watts.

In view of the prevalent difficulties with raw materials, special components, etc., we cannot forecast with accuracy when the set will be on the production lines. Our Principals' target is to have supplies ready to ship by August and we hope you will wish them luck. It is hoped that the price will not exceed £65.

### WARNING TO PURCHASERS OF DISPOSALS EQUIPMENT

It has been reported that the 24 inch Simpson Thermo-couple Ammeters, (calibrated 0-1.5 amp. r.f.), purchased by Victorian Division members, may be damaged if used on d.c. This is due to the unusual Thermo-couple design. If you desire to check your instruments at frequencies other than r.f., use 50 cycles per second a.c.



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1. Receiver has been designed primarily for Amateur Communication purposes, tuning range from 31 Mc/s to 1.7 Mc/s
2. Designed to operate from Standard AC Mains with inputs of 110 volts 200/240 volts, 40/60 cycles as well as from a 6 volt battery by the use of a separate vibrator unit.
3. The receiver consists of 9 valves as under:

TYPE	FUNCTION
EF.39	R.F. Stage
6K8GT	Frequency Changer
EF.39	1st I.F. Amplifier
EF.39	2nd I.F. Amplifier
6Q7GT	Detector A.V.C. & Audio Amplifier
6V6GT	Output Amplifier
6X5GT	Rectifier
EB.34	Noise Limiter.
EF.39	Beat Frequency Osc.

4. **INPUT IMPEDANCE**—400 ohms.
5. **TUNING RANGE.**
  - (1) 31 to 12.5 Mc/s.
  - (2) 12.5 to 5 Mc/s.
  - (3) 5 to 1.7 Mc/s.
6. **TUNING.** An electrical band-spread arrangement is used for this purpose. Fly-wheel control is utilised on the band-spread condenser drive. The scale is clearly marked with all amateur bands, and is so arranged to enable accurate re-setting to a spot frequency.
7. **I.F. FREQUENCY**—1600 Kc/s.
8. **CRYSTAL FILTER** is vacuum mounted to provide a high degree of stability. Phasing control and "in/out" switch are brought out to the front panel.
9. Sensitivity is better than 2 microvolts input, for 50 milliwatts output, at all frequencies.
10. **OUTPUT.** Audio frequency output exceeds 3.5 watts.
11. **"5" METER.** A socket is provided for an external "5" Meter.

**FOR FURTHER TECHNICAL DATA See Article on page 12**

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## FIFTY AND UP

Official Bulletin No. 82 from the A.R.R.L. Headquarters, Hartford, Conn., 27/3/47, to all Radio Amateurs:—

"The first 50 Mc. two-way contact between North and South America occurred on 23rd March at 2.50 p.m. E.S.T. when W4UJ, of West Palm Beach, Florida, worked OA4AE, Lima, Peru, a distance of 3,000 miles. W4GJO of Orlando, Florida, also worked OA4AE shortly after. W4UJ becomes eligible for the Milwaukee Radio Amateur Club's 50 Mc. Cup offered to the first amateur making two-way contact with another continent on 50 Mc. from the U.S.A. mainland.

"Favorable propagation conditions on 24th March resulted in reception of 50 Mc. automatic transmissions from PAOUN by South African stations ZS1P, ZS1T, ZS1AX, and ZS1DJ over a 8,000 mile path. The greatest distance at which 50 Mc signals have ever been heard. Possibility of International DX over North South path is good through April.

"V.H.F. workers are urged to watch frequencies near 50 Mc. from mid-morning to mid-afternoon and report any DX heard or worked."

### NEW SOUTH WALES

Owing to the maximum useable frequencies being so high during the last few weeks, naturally the activity on 50-54 Mc. was most pronounced especially in Sydney and the Blue Mountain areas where, daily and nightly observations were diligently carried out, but unfortunately, to no avail, because not a sign of the elusive DX was heard; although a few "ghost" carriers were logged with all the characteristics of a long-distance signal.

However no identification was given, despite repeated requests that this necessary procedure should be carried out according to regulations, so possibly some interesting contacts were presumably lost owing to forgetfulness on the operators' part.

On the other hand these strange carriers might have been harmonics of some high powered commercial station on a lower frequency who sometimes delight in leaving carriers running for hours at a time, just to keep a channel open for checking purposes. Anyhow the fact that no DX was reported was due to no fault of the active stations in VK2 who keep a constant watch on 50-54 Mcs.

The good news from the other side of the world regarding record breaking contacts between U.S.A. and South America, and a Dutchman being heard in South Africa helped to redouble the VK2 stations' vigilance; so summing up the situation, we can safely say that the New South Wales

boys will be amongst the first when conditions permit the DX to break through.

The following stations are on regularly in Sydney suburban and mountain districts, and we give their call signs in order of frequency: VKs 2ZN, 2AGL, 2IA, 2LY, 2AHF, 2NO, 2JU, 2ABZ, 2EM, 2XV, 2ALO, 2AZ, 2AC, 2YQ, 2MQ, 2JG, 2BZ, 2LS, 2AEX, 2NP, 2LZ, 2FO, 2AFE, 2ABC, 2AG, 2AFO, 2WJ, 2DF, 2LQ and 2ALP. Quite an imposing list you will agree and when the N.S.W. country members report on their activities and frequencies, and their call signs are added to the above, this State will perhaps have the honor of being the first to win the coveted W.A.S. trophy, because several VK2s only need VK6 to claim this award, which is quite a meritorious performance.

One is also impressed by the originality of the conversations that are carried out on the V.H.F. frequencies and it is a pleasure to listen to the interesting discussions on this and that, and the keen sense of humour that seems to be a feature amongst the VK2 stations.

Keen experimentation is another excellent phase of the activities, and the willingness to co-operate readily must serve as an example to the increasing number of listeners who derive so much pleasure by listening to the various contacts that are made. One cannot help thinking also of the progress that has been made in the design of the equipment. Although there are still a few stations in VK2 who are persevering with modulated oscillators and super-regen. receivers, the majority have crystal controlled transmitters and up-to-the-minute super-het. converters or some such, using the latest developments in V.H.F. tubes.

The quality of some stations is really excellent with VK2JU and VK2WJ among the top liners. 2ZN, 2NO, 2EM are also up among the best and as all these stations are crystal controlled with efficient plate modulation, this should prove to those who will persevere with the old style of mod. osc., with its bad frequency instability characteristic, that they are not in the race as the saying goes, and should definitely try their utmost to modernise their equipment. Fortunately those stations are in the minority and one by one they are "seeing the light," so we must be tolerant and lend the helping hand where necessary to make VK2 the first State with 100% crystal controlled transmitters and stable super-het. receivers.

This should not be such a difficult task because with the surplus equipment from the various Services at our disposal at quite a reasonable figure, the job is made so much the

easier and the techniques of building and testing 50 Mc. gear follow very closely the same routine as used on the lower frequencies.

Activity on 166 Mc. is quite high, there being some half dozen or so regulars going nightly. VK2AEE is using crystal control on this band and gets around quite nicely. VK2ABZ is another contemplating crystal and should be heard before long. VKs 2KI, 2AGL, 2YE, 2LZ, 2LY, 2AFO and 2WJ are heard most nights with reasonable signals at the writer's location.

There has also been some paper talk of operation on 1,400 Mc. but up to date no report has been received of any activity on this band. Speaking of reports we know very little so far of the work on V.H.F. being done by the N.S.W. country members and this includes the Newcastle gang which we understand are active but so far no worthwhile results have been made known. Therefore we would be very pleased to receive any information whatever, of your activities, experiments carried out, contacts, etc., and equipment in use, so that we can tell the rest of the world that the amateur in Australia is carrying out his part of the programme to the best of his ability.

In subsequent notes we propose to publish a full list of VK2 frequencies and station descriptions as they come to hand, really as a matter of interest and to tell the other fellow where we are and what we are using in the way of equipment.

The Council of the N.S.W. Division is endeavouring to organise an active V.H.F. section with a view to fostering interest among the VK2 members in frequencies above 28 Mcs. General opinion seems to be that it would be an excellent scheme and full co-operation seems assured. It was suggested that the V.H.F. Section hold regular monthly meetings at Science House, with its own administration responsible to the Divisional Council. This idea seems quite a sound one and should meet with general approval. Members will be advised through the usual channels viz.—"The Monthly Bulletin" and VK2WJ on Sunday morning broadcasts at 11 a.m.

### VICTORIA

The V.H.F. Group meeting was held on Wednesday, 9th April, the following being present: VK3s TR, MN, ACM, HK, AJH, BD, MJ, LR, XA, ARN, QO, ABA, NW, AHM, YJ, Messrs. Belcher, Gilbert and Gee Wah. The main item at the meeting was a very interesting lecture delivered by Dave Medley on V.H.F. receivers, and in particular the valves most suited for V.H.F. work.

On show were three receivers demonstrating the use of acorn tubes, button tubes and tubes of the EFSO



and ECH35 construction. After this lecture, extracts of which will be published in "Amateur Radio," there should be no excuse for anyone to have a poor receiver, because it became apparent that a simple combination such as 6AK5 r.f., 6AG5 mixer, and 955 osc., represents just about the ultimate for 50-166 Mc.

A successful field day was held on the 23rd March. Portables out were 3HK and 3DH Mt. Dandenong region, 3PK Arthur's Seat, 3LR Mt. Macedon, 3ABA-YS near McVeighs, 3NW Mt. Buller, 3HZ at Warrigul could be regarded in this light, and 3BW was another distant station. 3WO was on Mt. Buninyong. Of the Melbourne stations 3WI was heard at good strength from the Wireless-Institute rooms using the final amplifier of 3NW. The longest contact was that between 3NW and 3PK, approximately 110 miles, but 3HZ of 3LR was a close second. Record for number of contacts made must surely go to 3HK who, with 3MJ and 3YJ as alternative operators, had two-way communication with 20 stations.

3QZ, at Chelsea, constructed a 50 Mc. rotary beam during the morning of the field day and made his first appearance on that band. With the beam only 7 feet high he contacted 3HK at Olinda and received report of Q5 S9, so up went the beam to 35 feet. The rig consists of a 6V6 xtal osc., 6A6 doub., and 807 doub. to 807 final with 16.5 watts input. Antenna is a 4 element rotary with folded dipole driven element.

During the past month, activity on the 166 Mc. band in Melbourne has been showing signs of gradually increasing. In fact on some nights it would be quite possible to find two two-way contacts taking place at the one time. Considering the band is 4 megacycles wide, there is still plenty of room for those enthusiasts who find the experimental technique necessary for this V.H.F. band of practical interest. Small valves, capable of efficient operation in this band, appear to be readily available and as well as being suitable for receivers, can be used satisfactorily in transmitters, but even the old 56 can be used satisfactorily.

A number of stations at present on this band are using as the transmitting valve the 7193 (2C22), a triode with 3.3 watts plate dissipation, and in conjunction with small vertical beam aerials obtain very satisfactory results. To date propagation characteristics on this band are very reminiscent of the pre-war 56 Mc. band, and the general technique is also, in many ways, quite similar.

A general review of the latest activities of the various stations known to be on this band, is given below. 3EM, in McKinnon, is a newcomer to the band. He is using a 7193 as a transmitter, and a 955 as a super

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regen. receiver. A 4 element beam, 18 feet high, is used for the transmitter and a co-axial dipole, 40 feet high, is used for the receiver. 3MB, in Hampton, has been constructing portable equipment, and intends making use of a 7193 in a transceiver. He has raised his beam from 18 to about 25 feet, and obtained one S point increase in his signal at 3ACM in Hartwell.

3MJ has reached this band, using an 11 tube superhet. receiver and a crystal controlled transmitter using an 832 in the output stage. At the time of writing he has worked two-way with 3NW and heard 3ACM, 3MB and 3ARK. 3NB has been using a "Niutta" array consisting of two half-waves in phase and two reflectors one quarter wave behind, together with appropriate matching transformers. It appears to have reasonable forward gain and made considerable difference on reception of signals from the Brighton-Hampton area. Some preliminary work has been done on establishing crystal control at 3NB.

3NW has stabilised his transmitter with crystal control. Ken's signal is the first crystal controlled signal to appear on the band. He uses an 832 amplifier. 3OF has been conducting field tests with a portable transceiver and has been meeting with some success, and is able to communicate between Oakleigh and Hampton. 3WZ has been heard by 3NW, but largely works stations in the South. 3UJ has not been heard for a month, and not for want of listening either. 3XM has appeared on the band. He is using a 56 in a parallel lines oscillator, and a pre-war 56 Mc. J antenna.

As yet, he has been heard in a limited area.

3ACM is now on phone, having satisfied the authorities with his proficiency on the key—as stations on this band could testify. He has raised his six element beam to 22 feet and is trying to obtain results from a super regen. superhet, between contacts. 3ARK has appeared, using a super regen. receiver, and a transmitter with an 832 in the output. He tried out a ground plane antenna but found out, as others did, who tried this aerial in Melbourne, that the dimensions used were incorrect. As far as is known, no station is using a ground plane antenna correctly designed.

It would be interesting to know who has a receiver for listening on 166 Mc. band. Possibly some good listening distances are being consistently covered. The best suburban effort to date appears to be a two-band contact between 3LS in North Essendon, on 50 Mc., and 3MB in Hampton, on the 166 Mc. band. 3LS is about 250 feet and 3MB about 50 feet above sea level, and distant approximately 15 miles. There is, however, no intervening hill higher than 50 feet anywhere along this path. 3MB has also worked crossband with 3YJ, the latter being on the 50 Mc. band.

## QUEENSLAND

Today's star artist (with apologies to the ABC) is of course VK4HR, who on top of working 104 countries post-war, has added further lustre to his call by the famous 50 Mc. contact with WTACS (portable K6) on Monday, the 3rd of March, at 1213 hours.

Brisbane time. Our humble congrats Tibby. For the archives and for those who don't know, both WTACS and 4HR have heard one-another but as yet an actual QSO has not eventuated. As yet—we said, that means at the time of writing!

The next item on the programme is an account of the recent 50 Mc. Field Day held by the local V.H.F. gang, on the 23rd March. 4ES (with 4RC) set up his rig on Mt. Cootha, a baby mountain near Brisbane, whilst 4XG took the advice of the

sage who said "go west, young man," and with the rig in the back of the car journeyed as far as the Marburg Range, some 40 miles from Brisbane. He stopped at Haiglea, just beyond Ipswich and from this rather atrocious location made contact with 4ES, 4HR (at his home QTH) and also with 4KB who, with 4RT as side, was on top of Mt. Gravatt, also near the City. Reports varied from S8 to 8, and so as things augured well, Gordon (4XG) went on to Marburg where from the foot of the Range he received the locals at S8 to max. His signal was received by most of the locals at S8 to 8.

In all, a most successful day, and as line of sight frequently did not exist, it makes us feel that Too-womba and Ipswich would be a cinch. A listen was kept for the V.H.F. gang in Bundberg, but except that 4ES heard a weak signal for a couple of minutes, we did not achieve any results in that direction. Anyhow thanks fellows, and we hope you'll be with us again.

A very much improved signal on the band is that of 4TR, who is now operating on crystal. After a few bugs in the modulator have been cleared up, Dick's signal should be really tip-top. Fred Beech still tries valiantly to tame his converter, a job which has sorely tried his patience owing to a bout of the flu. We have it on good authority that any ordinary man would have been laid low, but not 4TB.

In the recent test with 4XG at Marburg, Arthur (4AW) received convincing proof that his beam was really pulling its weight as his signal was easily the best of the locals heard. We have it (reputedly from the horse's mouth) that he had to turn his house round to point his beam, but strongly feel inclined to put this down as a bit far-fetched.

4FB and 4ZU are both playing around with new receivers, the 400 in question being a certain fixed tune receiver used in aircraft. After minor alterations which included fitting conventional tuning to the oscillator and mixer, the line-up is 717A mixer 717A h.f.o., 12SG7s 1st and 2nd i.f., 12SQ7 det. and 12A6 audio. The job seems to perform rather well and we feel sure that it is quite capable of dragging in any DX that happens to be about.

#### SOUTH AUSTRALIA

5KZ puts in an excellent signal on 166 Mc. using an RK34, and 5GF puts a nice signal across town with his single 7193. 5GB has been doing a spot of mobile with p.p. 7193s. He was perfectly readable from the foothills, approximately 8 miles—or perhaps a little further. A week later we had what we claim to be the shortest QSO on this band. My shack

to the kerb, about 30 feet and Q5 both ways! Our skeds were unsuccessful on the run to Brighton although he copied my signal right to the Bay.

5NG has also put in some good portable work. He was QSD on the move, between Kinkaldy and Grange, six miles from here. Incidentally, it is believed that 5NG and 5GF hold the State record for this band, 12 miles. The past week has seen 5QR, QRX, on 166 Mc. anyhow. 5RT built a beam in the hope of working the DX station and the latter forgot all about the sked!

## DIVISIONAL NOTES NEW SOUTH WALES

Secretary: Peter H. Adams, VK2JX  
Box 1734 G.P.O., Sydney.

Meeting Place: Science House, Gloucester and Essex Streets.

Meeting Night: Fourth Friday of each month.

The monthly general meeting was held on Friday, 28th March. The meeting was very well attended and members showed great interest in the Agenda items for the Federal Convention. Some 54 items were discussed and members were given the opportunity to direct Mr. Jim Corbin, the N.S.W. delegate, as to the handling of each item.

It was good to see Mr. Morrie Myers (2VN), back in VK2 again. Morrie has been overseas on behalf of his Company and has promised to tell us about his experiences at the next meeting.

The matter of the allocation and despatch of disposal crystals will be attended to within the next few days although some frequencies are over ordered and will require balloting for.

Don't forget the technical articles for "Amateur Radio." There is a price of one guinea for the best article submitted each month. This offer holds good for six months so please go to it and help our magazine.

Welcome Bob Gordon, 2RH. A newcomer, but already well established on 14 Mc with the DX. Has a nice 8 tube super and an 807 in the final.

—...— 2DK is active on 28 Mc.  
—...— 2AJW has been re-building and will be on 14 Mc. soon with c.w. and phone. That new rig looks good Ray —...— There was a minor hamfest recently. 2XK, 2YA, 2BJ gathered at 2SY's shack. Mrs. 2SY provided the tea; much talk. —...— 2AT has new shack and three nice racks. Working on QSY by telephone dialling system.

The following are VK2 Zone Officers:— North Coast and Tablelands: VK2AFP, R. Gream; Newcastle and

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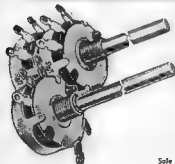
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### NORTH COAST AND TABLELAND ZONE

2LH is busy building an all band rig. Erected a 50 feet pole and a 14 Mc. electric-driven rotary is ready for mounting. Should be some good DX ahead. — 2ADE active on 14 and 28 Mc. and has 127 countries to his credit, 70 of same on 28 Mc. Chas still up to pre-war form. — 2NY working DX on 14 and 28 Mc. and recently added a c.r. modulation indicator to the works. — 2SH is heard frequently on 7 Mc. and am pleased to note that he hasn't given the air to c.w. since the phone ticket arrived. — 2AGM heard often with a nice signal; a rotary is under way and we hope it stands the gales. — 2CJ, Coff Harbour, on 7 Mc. phone at times, will be heard more often from his new home. — 2AFP is the Zone Officer, please send information to him at Casino.

### NEWCASTLE DISTRICT ZONE

When measured in terms of "ether busting" activity in this Zone is on the wane. 2BZ on 166 Mc. working 2VS, the latter temporarily in the District; good results have been obtained. — 2KQ is active on 50 Mc. and gets into Wyong. — 2ZC not very active but expects to work more in near future. — 2AHA gets his share of DX with a rotary. — 2FP still on 28 Mc. phone; one of our most consistent 28 Mc. boys. — 2WU on 14 Mc. with his old high class operating. Housing is problem and lives apart from gear (what a horrible thought). — 2AGY active on 14 and 7 Mc. with nice reports. — 2AGD active on 28 Mc. and new bottles ordered for his final. — No news of 2CS or 2KB, at least 2KB has been on 14 Mc. at times, but have doubts about Lionel ever getting on. — 2XQ QRL with new gear, had ideas of directive arrays for 28 and 14 Mc. but since 2EO won the DX Contest with a Zepp, will stick to the latter. Suggest forming a Zepp Club, entrance to those with 20 years uninterrupted operation with a Zepp—2XQ.

### COALFIELDS ZONE

2YO not heard of, how about some dope George. — 2XT mainly on 7 Mc. plenty of gear and big things should happen soon. — 2KZ is consistent on 28 Mc. phone and c.w. Max has been experimenting with 8JK half waves in phase with and without reflectors. — 2DG not much heard, probably is moving. — 2TY on 7 and 28 Mc. bands. How about some news from Lochinvar, Bob. — 2LB toying with a beam on 14 Mc. phone and c.w., a

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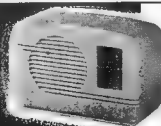
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new final is under way. ——— 2MK has deserted 14 for 7 and 3.5 Mc.; uses a conventional Zepp. ——— 2PZ is mainly on 7 Mc. on week-ends, accumulating a lot of disposal stuff. ——— 2ADT, the Zone's most active Ham, had 367 contacts in W phone test with a multiplier of 43. Contacts on 28, 27, 14 and 3.5 Mc., and is possibly the highest phone score. An 807 with 30-35 watts did the job. A QSL from AC4YN is a prized possession. ——— 2YL, with 4 half waves in phase on 14 Mc. has f.b. results. 386 contacts and a .33 multiplier was the result in c.w. W test. 162 countries up to date post-war.

## SOUTHERN ZONE

2VK should be on the air when this goes to print. Xmitter is 6F6 e.c.o. and Telefunken RL12P-35, antenna Zepp, receiver revamped Hallicrafters. Hugh not so pleased with the e.c.o., so some xtal grinding is ahead. ——— 2GG is re-building and making provision for phone Rack and panel, built as an operating desk. ——— 2APW operating on 7 and 14 Mc. and is very pleased with new receiver. ——— 2EU building new home and will be more active in the new QTH. ——— 2OJ at last finished new 55 feet tower and driving gear under construction. Erection and lawn mowing will be done in a short time (fingers crossed). ——— 2ANQ expects to be on shortly with p.p. 809s. 807s to be used as modulators. More notes from other Southern Zone boys wanted. QTH: Box 54, Albury.

## VICTORIA

Secretary: A. B. D. Evans, VK3VQ, Box 2611 W.G.P.O., Melbourne.

Meeting Night: First Wednesday of each month.

Meeting Place: Radio School, Melbourne Technical College.

### T.A.C. NOTES

The most outstanding event to report this month is the successful meeting held by V.H.F. Group on Wednesday evening (5th April). Dave Medley (VK3MJ) gave a most interesting lecture on V.H.F. Receiver Design, extracts from which will appear in "Amateur Radio." The animated discussion which followed proved that this subject was of the greatest interest to members of the Group. By the way one noteworthy outcome of this meeting was that Dave was persuaded to re-occupy the chair, on the condition that during his enforced absences members would take it in turn to act as chairman. This should prove a most interesting and instructive innovation.

The transmitter exhibited by Don Hope (VK3XO) represented the optimum design for such a unit, and we hope to persuade Don to publish final details and results in "Amateur Radio," in any case we must congratulate Don on the very excellent effort.

The new VK3WI transmitter has passed with honors the first series of tests, and by the time this screed is published should be operating in Band Edge Location Service. Eric Ferguson is about to commence the conversion of one of the G.O.s for use in Communication Service.

The T.A.C. is awaking with interest the formation of the new "Receiver Group." The formation meeting has been convened by George Neilson for 23rd inst. at Institute Rooms in Queen Street, and we hope the Group will prove of great interest and value to members. After all the two most important items in any Ham Shack are the Frequency Meter and Receiver.

As pointed out in previous notes, the T.A.C. is endeavouring to raise the technical standard of "Amateur Radio," while at the same time catering for the reader who is interested in construction. To this end we invite readers to submit constructive criticism of the items published. These criticisms will be published, together with author's reply and editorial note, where applicable. The whole object is to promote discussion section, for it is by such discussions that we are able to clarify points which may be open to misinterpretation, or need further amplification—your criticism (constructive) will be most helpful. What about it OMs.

The T.A.C. is seeking the co-operation of members who are able to devote a certain amount of time, in the home workshop, to the construction of class demonstration equipment—drawings and kits will be supplied.

### VICTORIAN DISPOSAL NEWS

Victorian Members are advised that the gear is now available off the latest "screed" and will be issued on every Tuesday night except the first Tuesday, as indicated on the "screed."

Do not make any telephone enquiries re the gear on the "screed" to any other number than FJ 6997 so as to help yourselves. This is important as the records are only kept at the rooms and it takes up the time of the various members of the Disposal Committee which could be used in furtherance of their business.

Do not forget that Lokalt sockets and VCR139A sockets are available for those who drew those types of tubes.

## QUEENSLAND

Secretary (acting): F. Nolan, VK4JU, Box 638 J, G.P.O., Brisbane.

Meeting Place: State Service Building, Elizabeth Street, City.

Meeting Night: Last Friday in each month.

The Annual Meeting of the VK4 Division was held at the State Service Rooms on Friday, the 28th of March, and was well attended. Newly elected President, 4AW, was in the chair, and after opening the meeting extended a welcome to 4KO and 4WS, visitors from Ipswich. The minutes of the last Annual Meeting were read, followed by the Council Report and the Financial Statement.

4AW then moved a vote of thanks to 4RC, the retiring Treasurer and Asst. Acting Secretary. Bob has done a swell job and the vote was carried by acclamation. Discussion took place regarding the annual "Dinner" which we propose to hold in the Lady Bowen Hostel, Wickham Terrace, City. The tentative date fixed was the 18th April, which will enable delegate 4ES to return from the Convention.

Most of the positions of the new Executive were filled last month, the nominations being unopposed, the exceptions being the posts of Vice-Presidents, Federal Councillor, and Publicity. These jobs were therefore ballotted for and the following is the set-up for 1947-48:—President 4AW, Secretary 4RT, Treasurer 4ES, Vice-Presidents 4KH and 4KB, Federal Councillor 4KB, Country Representative 4SN, Traffic 4JL, Publicity 4ZN, Librarian 4LT, QSL Manager 4EN, and V.H.F. Representative 4ZU.

Mr. Frank Nolan (4FN) outlined his progress with 4WI and the following is presented for general consumption. 4WI in future will operate simultaneously on 7100 and 14116 Kc. on Sunday mornings between 10 and 11 a.m., and as an added service will offer a Frequency Measurement Service on Tuesday nights between 8 and 9 p.m. The accuracy will be of a very high order and we feel sure that Frank will feel rewarded if the service is availed of. Pat Kelly at this stage of the meeting spoke in admiration of 4FN's effort, and in general, his enthusiasm for the job. We take it upon ourselves at this stage to say "thank-you" to Harry Angel (4HA) who filled the position when otherwise 4WI would not have been on the air.

Some fifty odd agenda items for the Convention were discussed and the views of the assembly made known to the Delegate. Discussion on 4HR's recent achievement on 50 Mc. took place and 4SN suggested that a special trophy or prize should be awarded in recognition of the feat.

did you hear him? —...— 6KW has a cat walk for his tower finished now to carry out repairs and alterations to his beam. While Ron is not a cat he reckons he is learning.

6TX was overheard ordering some chassis over the phone the other day. Jack is daily growing more Ham minded again and when he is not fishing off Mosman Bay he is listening —...— 6AH was QSO'd by 6KW a couple of weeks ago. Stan tells us that 6MH (his XYL) is threatening activity too, but she is a bit mike shy so will be on c.w. for a while anyway. —...— 6MU is back again on the air from Merredin after letting all the big ones get away at Rott-nest. We think Mal is better on the end of a microphone than a fishing line. —...— 8KE was heard on phope the other night and quite nice quality too. What about a rest from it Keith on third Monday of the month?

## TASMANIA

Secretary: J. Brown, VK7BJ  
12 Thirza Street, New Town.  
Phone W 1328.

Meeting Place: Photographic Society's Rooms, 183 Liverpool Street, Hobart.

Meeting Night: First Wednesday of each month.

The Council meeting for March was conducted at our President, L. Jensen's residence, 313 Park St., New

Town, on the evening of Friday 21st, with 7LJ in chair, and others present were 7BJ, 7CT, 7CW, 7RF and 7PA. Apology from 7CJ. Minutes of previous meeting were read and confirmed. Correspondence and traffic network communications read and received, news of removal of 30 minute QSO limit was received with pleasure, and hopes are high for further relaxations. A quantity of inter-divisional correspondence was attended to. One membership application was received from J. T. Wilson (7JT) and passed on for general meeting's confirmation.

At the general business the Convention Agenda was the main item for discussion and occupied the remainder of the evening as, by the time Mrs. Jensen's supper could be done justice to, it was 2100 hours, so after expressing appreciation all were satisfied to be on their way leaving 7LJ to his weekly traffic skeds.

General Meeting, 2/4/47, present were 7LJ in chair, 7BJ, 7CJ, 7OM, 7AL, 7CL, 7DW, 7YY, 7LE, 7GR, 7MY, 7XA, 7TR, 7RF, 7CT, Messrs. Koglin, Durkin, Allenby, Moore, Harris, Crosswell, Fulton, Brown and Cruise. Apologies from 7PA and 7RY.

Minutes of previous meeting were read and confirmed. Correspondence from Federal Executive on use of high power components, also re Ocean Currents "Raft" Expedition (can

think of better places to drift), and from N.S.W. Division re Technical Publications. New Member (J. T. Wilson) was unanimously elected to full country membership, welcome OM.

C. Oldham, "chief organiser," in the Food for Britain drive, reported progress. He has contacted VK7CM, now in England, and has received a reply in which Charlie says he is only too willing to represent us over there if needed. The fund here is mounting and this meeting added a further £5/10/- to it.

Another Field Day was concluded on 16th March, and from general opinion it was the best yet. As proof of this, yet another day is to be devoted to conducting the fourth, and this will possibly be the last, outing before the winter. Sunday, 20th April, has been named and all previous conditions will again apply, 10 a.m. to 1 p.m. on 3.5 Mc band within 15 miles radius of G.P.O. with 7LJ doing the honor of transmitter hiding —don't make it too hard Lou and keep off the bush tracks!

The Convention Agenda occupied the balance of the night, thus no lecture was given and next meeting will be devoted to our delegate's report and has been reserved for same.

7LL suggested that an auction of Ham gear might be considered at a future meeting—this should make a good variation for a winter's night.

# RED LINE TRANSFORMERS & CHOKES

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157 Elizabeth St., Melb.

As there is no separate report of the last Field Day here is an outline of the day's activities which, as previously stated, was a great success. The start was at 10 a.m. on Sunday, 16th March, from Customs House, Wharf, where participants received sealed instructions and moved off for the first bearings.

7AL, having selected South Arm, situated as it is on a Peninsula approached from the eastern side of the Derwent, he set out, none too early, to reach the rendezvous and instal the gear. Yes! that would happen. Some river traffic demanded the opening of the bridge section just at that time and that was enough for a delay which was blamed for being just three minutes late getting on.

The first signal came to those listening from away down the Harbour (or may be the Hills in the opposite direction) accepting "down the Harbour" as O.K. Then which side? Over the bridge or not? Fortunately most decided to risk a crossing, two didn't and one of these finally spent the day at Brown's River—quite a nice beach of course—but about three miles or more by water and much too far to swim, and some 20 odd miles by road from where the directions,

when opened, said. The party consisted of 7XA, 7JH and family, of course time beat them.

7CW and party almost shared the same fate, being well nigh the same destination when he decided to turn back and make a dash for it having also realised that the signals had been playing tricks, not having shown a swing away until almost directly opposite the location, he beat the time by 15 seconds (officially) although rumour has it he was so roundly cheered and kept so pre-occupied that time slipped by—not suggesting that they did it on purpose Cros! Official time is taken from the heading in of the sealed directions unopened.

Here is the official list of those who finished with time of finishing and in the name of person in charge of each car:—7LJ (1st) 1145 (1½ hours), 7YY (2nd) 1155, 7BJ (3rd) 1205, Watson 1214, 7LL 1214½, 7NL 1217, 7CT 1222, 7OM 1223, Fulton 1244, 7CW 1259½, 1300 hours being limit, O. L. Brown arrived 1305 after opening his envelope. After a well enjoyed lunch the afternoon was spent at cricket for the lads and a chinwag for the lassies and both played their part well.

Some unorthodox practices were indulged in by the cricket group, sides were taken and additional players were enlisted from the locals, in fact if rumour can be believed, one side had reserves waiting just in case. What actually constituted a side was not revealed but a great afternoon's cricket was the outcome and all enjoyed themselves, the weather again was perfect although earlier it caused some doubt.

Minor "casualties" were reported, owing apparently to road conditions, and constituted a broken spring or two, a cracked chassis and it seems one car, that of 7YY, which had designs on going back to the Arm, having swung around in its own length and faced about. No doubt it had been so shaken up Bill that it lost its sense of direction, no car would refuse to go home! Fortunately no physical harm is reported so all is well that ends well. See you at next Field Day—maybe!

The first 7 Mc. ragchew took place on Friday, 28th March, with 7AB, 7CW, 7LE, 7MY and 7XL. 7LJ was also a tryer, more are asked to keep these evenings in mind, 8 p.m., 2nd and 4th Fridays in each month.

**A  
B  
A  
C**

**AUSTRALIA'S**

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**AMPLIFIER**

**COMPONENTS**



## **ABAC**

### **Standard Receiver**

Or Instrument Case. Takes 19 x 8½ panel with clear panel space 17½ x 7½. Depth of case 11 inches.

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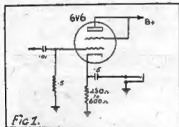
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## LOW IMPEDANCE HEADPHONES

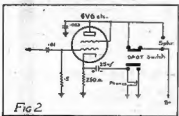
By J. BROWN, VK7BJ\*

There are a great number of good headphones obtainable cheaply these days, the only catch being that they are of low impedance. This makes them more reliable, but they do not work too well when just connected in the plate circuit of a valve. One way to use them is to buy the associated step down transformer, but this does not seem to appeal to Hams as a whole, although it is an excellent scheme; perhaps they object to the extra bulk and weight.

Another system which, while quite common, may not be known to Hams generally, is use of a "Cathode Follower." This is a valve with the load entirely in the cathode circuit, giving a high degree of inverse feed-back. The net result is that although the valve will not amplify the input voltage, it provides a good match for the low impedance phones.



The cathode follower with low impedance phones will give results equivalent to a standard triode amplifier with high impedance phones or low impedance phones with a transformer for matching. The recommended circuit is as shown in Figure 1; note that there is no cathode by-pass condenser. For headphone use only, the higher values of cathode resistor are preferable as they reduce the standing plate current.



The circuit can be expanded to switch from a loudspeaker in the plate circuit to headphones in the cathode circuit as shown in Figure

2. This circuit can be used with high impedance phones but the level in them will be lower, but it makes a convenient answer to the old problem of switching from speaker to phones as the speaker may be disconnected altogether when using phones, if desired.

## RADIOTRON 6AU6

R.F. AMPLIFIER PENTODE WITH SHARP CUT-OFF.

MINIATURE TYPE (Tentative Data)

Radiotron 6AU6 is a miniature R.F. triode-grid valve with a sharp cut-off characteristic, low grid-plate capacitance, and high transconductance. The low value of grid-plate capacitance minimises regenerative effects, while the high transconductance makes possible a high signal-to-noise ratio. Because of its high transconductance and sharp cut-off, the 6AU6 is particularly useful as a limiter valve in F.M. receivers.

### GENERAL DATA

#### Electrical

Heater, for Unipotential Cathode:

Voltage (a.c. or d.c.) ..... 6.3 volts

Current ..... 0.3 amp

Direct Interelectrode Capacitance:

Grid No. 1 to Plate 0.0035 mmfd.

Input C ..... 5.5 mmfd.

Output C ..... 5.0 mmfd.

#### Mechanical

Mounting Position ..... Any

Maximum Overall Length ..... 2-1/8"

Maximum Seated Length ..... 1-7/8"

Length from Base Seat to Bulb Top (excluding tip) ..... 1 1/2" plus or minus 3/32"

Maximum Diameter ..... 3/8"

Bulb ..... T-5-1/2

Base ..... Miniature Button 7-BK

Basing Designation ..... 7BK

Pin 1—Grid No. 1 (control grid).

Pin 2—Grid No. 3 (suppressor).

Internal Shield.

Pin 3—Heater.

Pin 4—Heater.

Pin 5—Plate.

Pin 6—Grid No. 2 (screen).

Pin 7—Cathode.

### AMPLIFIER

Maximum Ratings, Design-Centre Values

Plate Voltage ..... 300 max. volts

Grid No. 2 (Screen) Voltage ..... 150 max. volts

Grid No. 2 Supply Voltage ..... 300 max. volts

Plate Dissipation ..... 3 max. watts

Grid No. 2 Dissipation ..... 0.65 max. watt

Grid No. 1 (Control Grid) Voltage:

Negative Bias ..... 50 max. volts

Positive Bias ..... 0 max. volts

Peak Heater-Cathode Voltage:

Heater negative with respect to

cathode ..... 90 max. volts

Heater positive with respect to cathode	90 max. volts
<b>Typical Operation and Characteristics Class A1 Amplifier</b>	
Plate Voltage	100 250 250 volts
Grid No. 3 (Suppressor)	Connected to cathode at socket
Grid No. 2 Voltage	100 125 150 volts
Grid No. 1 Voltage	1 -1 -1 volt
Plate Resistance (Approx.)	0.5 1.5 1.0 megohms
Transconductance	3900 4450 5200 micromhos
Grid No. 1 Bias for plate current of 10 microamperes	-4.2 -5.2 -6.2 volts
Plate Current	5.2 7.6 10.8 Ma.
Grid No. 2 Current	2.0 3.0 4.3 Ma.

### CORRESPONDENCE

539 Marion Road,  
Sth. Plympton, S.A.

Editor, "A.R."

During the past few months I have received QSL cards from many overseas amateurs (in reply to SWL reports) and remarks on many of the cards make it apparent that VKs are notorious for their failure to QSL stations they have worked. To quote a couple—

From GW5YB, 80 Penrhos Road, Bangor, North Wales, "How about persuading some of the VK transmitters to QSL OM? Have not received a single card back from them," and from VEEBG, 192 Victoria Ave, Longueuil, P.Q., Canada, "Have had many VK contacts but no cards."

It is rather a poor show when overseas stations have to rely on SWL cards as proof that they have been heard in VK.

Suggest that you make some mention of this matter in "A.R." Enjoy the Mag. very much and look forward to it every month. Am newly appointed secretary of the S.A. Australian DX Radio Club and editor of the amateur section in the Club Mag. "DXSA." Hope to have VKs call one of these days. Cheerio, es 73,

A. W. WRIGHT.

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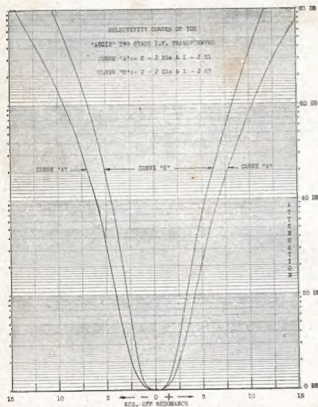
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